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ABSTRACT

Behavioral psychology studies were reviewed in an examination of the relationship between individual concept levels and teaching behaviors. It was observed that high concept level student teachers helped their students evaluate information and formulate hypotheses more frequently than did low concept level student teachers. It was also found that high concept level teachers preferred to use an inductive mode of teaching, presenting first an example and then a rule. Low concept level teachers preferred the reverse, rule-example order of presentation. A study was made to test the hypothesis that student teachers and cooperating teachers who are initially matched on a conceptual level will show greater gains in concept level development than will mismatched pairs. Participants (93 student teachers and 88 cooperating teachers) responded to a test designed to tap the level of complexity and organization of interpersonal concepts. The resultant dyads were pretested within the first 2 weeks of the internship and post-tested at its conclusion. Post-test results show the trend for matched pairs to be in the predicted direction. It was found that scores of mismatched pairs seemed to drop over time. Implications for teacher education are discussed. (JD)

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CONCEPTUAL LEVEL MATCH/MISMATCH: CONSEQUENCES FOR CLINICAL TEACHER EDUCATION

Hobart Hukill

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CONCEPTUAL LEVEL MATCH/MISMATCH: CONSEQUENCES FOR CLINICAL TEACHER EDUCATION

Rooted historically in child psychology, the purview of developmental psychology has only recently turned to adulthood. Most early models of development assumed that the adult life pattern was, for better or worse, stabilized in adolescence. Freud's psychodynamic model and Piaget's cognitive developmental model, while profoundly different in their emphases, shared this initial assumption. As these models were elaborated and revised most notably by Erikson within the psychodynamic tradition and by Piaget, Kohlberg, and Hunt within the cognitive developmental tradition, adult development became an area of inquiry in its own right.

Interpenetrating this emergence of adult development was the question of whether adult development could be fostered, a possibility which Piaget had earlier dismissed in reference to childhood development as "the American fallacy." However, it can be argued that inasmuch as adults differ from children in quantity of life experience and quality of their cognitive structures, they may be more amenable to interventions aimed at stimulating development. This, of course, would have important practical implications for improving the entire area of adult education from formal college curricula to informal educational pursuits.

Due to its genesis in secondary and post-secondary education and environments, the Hunt model is the most directly applicable to adult education in general and to clinical teacher education in particular. Evidence for Hunt's model and for its matching principle will be presented. Interventions aimed at stimulating cognitive development will be discussed. In the final sections propositions and empirical evidence will be presented for the reciprocal character of Hunt's matching principle and the possible theoretical and practical importance of this feature.

Hunt's Conceptual Levels Model

The implications of the conceptual levels (CL) model for adult education in general and teacher education in particular have been more thoroughly investigated than any of the other cognitive developmental models. This reflects its genesis in secondary and post-secondary educational contexts (Harvey, Hunt, & Schroder, 1961) rather than in child psychology. The CL model posits that adults move through a series of stages, conceptual levels, characterized by increasingly complex and integrated interpersonal concepts (Figure 1). Because of this interpersonal focus, this model has the further advantage of being more directly translatable into educational practice than those of Piaget or Kohlberg. For a detailed description of the theoretical properties of the conceptual level model see Harvey, Hunt, and Schroder (1961) and Hunt (1966).

Characteristics of CL-derived Educational Environments

One feature of the conceptual levels model which makes it particularly useful for guidance of adult education in general and teacher education in particular is its explicit concern with deriving characteristics of instructional environments appropriate to adult learners from a consideration of their conceptual level characteristics. Figure 2 shows the types of environmental match/mismatch and their expected outcomes for each of three levels of learners. For a variety of contextual reasons most adult learners cluster at Level II or below; therefore, we will consider here only person-environment matching at these first levels. The logic of matching at higher conceptual levels remains the same, though. An optimal environment for Level III, for example, would stress mutuality and collaborative problem-solving.

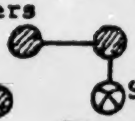
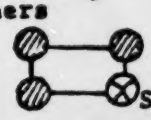
Stage	Diagrammatic Representation	Course of Development	Specific Conceptual Work
Sub I		Articulation of First stage	Learning the "ground rules" of interpersonal relations which apply to everyone
Stage I	Generalized other	Progression to Second stage	
Transition to II	Other	Articulation of Second stage	Learning about oneself and how one is distinct from generalized standards
Stage II	Other Self	Progression to Third stage	
Transition to III	Other Self	Articulation of Third stage	Applying these self-anchored dimensions to an empathic understanding of other persons and the differences between them
Stage III	Others Self	Progression to Fourth stage	
Transition to IV	Others  Self	Articulation of Fourth stage	Placing these dimensions applicable to self and others into meaningful integrated relation.
Stage IV	Others  Self		

FIGURE 1. Developmental Stages for Interpersonal Orientations under Optimal Conditions. (Hunt, 1966, p. 281)

Present Level	Environment	Match/Mismatch	Expected Outcomes
	Clearly organized within normative structure	Optimal	Open I
Sub I	Normatively unclear or inconsistent	Sub-optimal	Closed Sub I
	Emphasis on autonomy	Super-optimal	Closed Sub I
	Emphasis on automony within normative structure	Optimal	Transition to II
Open I	Clearly organized within normative structure	Sub-optimal	Closed I
	Highly autonomous	Super-optimal	Transitional arrestation
	Highly autonomous with low normative pressure	Optimal	Open II
Level II	Clearly organized within normative structure	Sub-optimal	Closed II
	Emphasis on mutuality	Super-optimal	Closed II

Figure 2. Outcomes of Selected Conceptual Level-Environment Combinations. (Hunt, 1971, p. 22)

It should be clear, for example, that the optimal environments for persons at Sub I and Level II would be different. Progression to Level I from Sub I involves learning and internalizing social norms. Thus, the optimal learning environment for progression to Level I would have clear, consistent, and explicit standards, and would stress conformity to those standards. The learning tasks would be highly structured and the presentation of information would be as unambiguous and as concrete as possible.

In contrast, the optimal Level II environment would permit independent self-assertion and minimize conformity to norms, so that the Level II learners could articulate how they differ from normative standards. Their learning tasks would be individualized and discovery-oriented, and the presentation of here information would emphasize contradictions, paradoxes, ambiguities, and inconsistencies.

In a matched condition the learner's conceptual structures are "open," that is, they have potential for further progression to qualitatively more complex and integrated states. Mismatched conditions produce "closed" structures which are not amenable to further development. In short, optimal matching involves high-structure environments for low CL learners and low-structure environments for high-CL learners.

Empirical Bases for the CL Model

Over the past decade Hunt and his associates have investigated various aspects of the CL model, providing support for the characteristics as outlined above and validating the matching premise. Much of the research was conducted on secondary students and teachers in both preservice and inservice education, although some parallel studies were conducted on counselors and their clients.

The studies which focused on the relationship of CL to various learner and teacher characteristics as well as those which focused on learner outcomes

as a function of CL match with environment are essentially cross-sectional in nature. That is, the developmental continuum is assumed and the objective is to verify that behaviors logically related to particular levels of the continuum manifest among individuals at those levels. The bulk of the studies discussed below are of this nature.

Though fewer in number, longitudinal studies have been undertaken which do lend support to the developmental nature of the CL model specifically and to cognitive-developmental premises in general. These will be discussed in a later section which deals with evidence for the efficacy of interventions to promote development. In these studies measures of several developmental domains were usually taken pre- and post-intervention, providing for some cross-validation of the developmental constructs.

Learner Characteristics and CL

One series of studies which principally investigated interactive effects of the teaching/learning process also generated information on CL-related characteristics consistent with the model's predictions (Hunt, Joyce, Greenwood, Noy, Reid, & Weil, 1974). Measures requiring higher-order skills such as causal inference and induction are related to CL measures, but measures requiring simple objective recall are not. In the absence of a teacher to direct their learning tasks, low CL students usually chose a leader from among themselves to direct the activity. High CL students usually worked without a leader. One study involving person perception and CL showed that high CL students formed more accurate impressions of teachers (that is, were less stereotypic and more sensitive to individual differences) than low CL students (Wolfe, 1974).

Teacher Characteristics and CL

The studies which have shown relationships between CL and teaching behaviors have particular relevance to clinical teacher education. High CL student teachers were observed to help their students evaluate information and formulate hypotheses more frequently than low CL student teachers (Hunt & Joyce, 1967; Murphy & Brown, 1970). Given the emerging abstractness of many adolescents, this would certainly support CL development as an objective, at least, for secondary teachers, both preservice and inservice.

Tomlinson and Hunt (1971) found that high CL student teachers preferred to use an inductive mode of teaching, presenting first an example and then a rule. The low CL student teachers preferred the reverse, rule-example order of presentation.

Joyce, Weil, and Wald (1973) found that in a preservice teacher education program which taught three different models of teaching (Inductive Teaching, Role Playing, and Group Investigation), CL was not a significant predictor of skill acquisition within a single model, but was significantly correlated with student teacher capacity to learn all three. According to the CL model, the high CL student teachers with more complex information processing capacities were better able to conceptualize an integrated whole from the three disparate models.

In a related finding Joyce (1975) reported that merely training teachers in a variety of discrete teaching models without regard for their conceptual level was not sufficient to alter their usual direct (and often inappropriate) didactic classroom behavior. Again, it appeared that even though the teachers could technically exhibit the skills they had learned within discrete models, most apparently lacked sufficient conceptual level development to organize the

three models into an integrated scheme, and apply them appropriately in their classroom settings.

This is not to say that there were not other social, political, and economic factors which militated against adoption of the models within most of the classrooms. Rather, it appears that CL determines the extent to which complex coordinated teaching behaviors can be assimilated by teachers. Thus, it is important to account for CL as well as contextual factors in teacher education programs.

Another study indicated that high CL teachers used different levels of structure appropriate to their students' own conceptual levels (Joyce, Lamb, & Sibol, 1966). Hunt, et al. (1974) also found that high CL teachers tend to be more flexible, stress tolerant, and adaptive than low CL teachers. In findings particularly important for multicultural settings, it was shown that the abilities of high CL teachers to take multiple perspectives, use various coping behaviors, and employ various teaching models led to their increased effectiveness with students from diverse cultural backgrounds (Harvey, Prather, White, Alter, & Hoffmeister, 1966; Hunt, 1975).

In an analogue study of counseling interns it was found that high CL interns made more emphatic expressions than low CL interns (Heck & Davis, 1973). In another, high CL interns were found to accept clients' feelings and praise them more than low CL interns. Low CL interns gave more directions and criticism (Goldberg, 1974).

Conceptual Level Matching Effects

Hunt (1977) distinguishes two purposes of matching: contemporaneous and developmental. The contemporaneous purpose is short-term, concerned principally with optomizing learner-environment match so that assimilation of

content can readily occur. Implicit in this short-term purpose, though, is the longer-term, developmental purpose.

As the learner consolidates and elaborates the conceptual structures at a given level through interaction with a matched environment, new conceptual work will emerge based on the learner's perceptions of the contradictions and limitations inherent in those structures. If the environment changes to accommodate this transition (developmental matching), then the learner will progress to higher-order articulation and integration of his or her conceptual structures. Thus, contemporaneous matching, if frequent enough, lays the foundation for long-term CL development. As mentioned above, evidence for the longer-term matching effect on CL development will be discussed in a later section dealing with programs which have attempted to foster development in various domains, including CL.

Numerous studies show strong support for contemporaneous CL matching effects. Because inductive teaching requires higher-order cognitive skills, Hunt, et al. (1974) considered it matched for high CL students. Both low and high CL students were taught causal inference using the inductive approach over a four-hour period. The initial superiority of the high CL group increased significantly over the instructional period. The low CL students showed no significant gain in causal inference. In another study (Zampogna, 1975) the matching model was applied to language learning (French and Spanish). Both high and low CL students were assigned to two learning environments for a term of instruction: adaptive (high CL match) and traditional (low CL match). Gain scores on a language speaking measure revealed that the greatest gains were as predicted by the CL matching model;

the high CL-adaptive group and the low CL-traditional group made the greatest gains.

Brill (1977) studied the differential effects of very high structure treatment and moderate structure treatment on very low and moderately low CL delinquent boys in an institutional setting. The boys were released after at least one year of treatment. As predicted by the matching model, very low CL-very high structure and moderately low CL-moderately high structure combinations resulted in less post-discharge problem behavior and better adjustment.

Of more relevance to pre- and inservice teacher educators, Heck (1971) studied the differential effects of a low structure approach to communication training versus a high structure approach on student teachers who varied on CL. In order to increase adaptability in interpersonal communication, the low structure approach used sensitivity training; the high structure approach, a Human Development Institute package. Consistent with the matching model predictions, high CL student teachers showed greater gains in communication adaptability with the low structure environment, and the low CL student teachers gained most with the high structure environment.

Further matching effects will be considered when studies of the interventions designed to promote CL development are discussed in the next section. However, given the above review of CL matching studies, the contemporaneous purposes of CL matching seem well served by this procedure, and appear to be highly relevant for the design and implementation of programs for preservice and inservice teacher education. In addition, the CL model provides a useful framework for diagnostics of teaching behaviors and guidelines for preservice and inservice teacher education.

Findings from Programs Which Have Attempted to Stimulate Adult Cognitive Development

Norman Sprinthall and his associates designed and implemented numerous Deliberate Psychological Education projects throughout the previous decade (for reviews and details, see Sprinthall & Mosher, 1978; and Oja, 1980). These programs to stimulate cognitive development were focused initially on secondary students, but later included college students, student teachers, and regular classroom teachers. Most were designed specifically as alternatives to traditional preservice or inservice programs. Based on cognitive-developmental models, these programs shared several features in common:

1) Clients were given practical instruction followed by "guided reflection" on the experience via seminars, conferences, and journals.
2) Role-taking opportunities which allowed the clients to try out more complex behaviors and encouraged taking the perspective of another were stressed.
3) On-site followup, supervision, and counseling among the clients was implemented.
4) Support groups and networks were used to help clients deal with cognitive conflict.

A series of courses in psychology was designed for secondary students. In addition to content acquisition, cognitive development was an explicit goal of these courses. They involved actual applications of psychology plus a seminar to provide guided reflection on the experience. Dowell (1971) and Rustad and Rogers (1975) designed and instructed a semester-long counseling psychology course which prepared students to be peer counselors. In these two

studies the experimental and control classes were intact groups. Mosher and Sullivan (1975), and Exum (1977) designed educational psychology courses with emphasis on cross-age teaching. Each of these courses lasted an entire academic year and used randomly assigned experimental and control groups. The Exum study was conducted at a junior college. Cognetta and Sprinthall (1978) also designed and instructed a high school educational psychology course, but for only a single semester. Their study employed intact experimental and control groups. Hedin (1979) designed and instructed a semester-long psychology course which used interships in community mental health settings and other role-taking opportunities in conjunction with weekly seminars. This study also employed intact experimental and control groups.

In all of the above studies, two indices of development were used, a measure of moral development (Kohlberg, 1969) and a measure of ego development (Loevinger, 1966). Significant gains on both measures were reported by all programs except for moral development in the two counseling studies. (Gains were in the predicted direction, but were not significant.)

In another study (Preuss, 1976) child development was taught in a practicum (one morning per week in a preschool) combined with a seminar (two hours per week in class). Student discussion was monitored during the seminars, and blindly rated for level of complexity. It was found that student discussion moved from concrete to abstract over the course of the program.

A Deliberate Psychological Education program for student teachers was designed by Glassberg (1977). This program used a peer supervision curriculum. Like most of the other studies, its format was practicum-seminar. In the experimental seminar the student teachers were given role-taking opportunities, problem solving techniques for role conflicts, and exercises in

multiple perspective taking. The seminar also promoted reflection on these experiences as well as the usual field experiences in the secondary schools. Control student teachers attended the regular weekly seminars usually offered as part of the student teaching practicum.

Because development was an explicit goal of the DPE program, two developmental measures were taken, moral development (Rest, 1974) and ego development (Loevinger & Wessler, 1970). The student teachers were assessed on their classroom performance as well, by means of three instruments: Reflection of Feeling, Flanders Measure of Indirect Teaching, and the Behavioral Contracting Measure. All measures were administered pre- and postpracticum. Correlated t-tests revealed that the experimental student teachers as a group had made significant gains on all of the measures, developmental and behavioral. The control group showed no significant gains.

Bernier (1976) designed the first DPE program for inservice teachers. The curriculum was designed to promote cognitive development in three domains: conceptual systems (Hunt), moral (Kohlberg), and ego (Loevinger). Also, blending role-taking with reflection, the program focused on the cultivation of responsible role-taking within a network of collegial relationships. The experimental teachers enrolled in an intensive, six-week summer workshop which met for four days a week, three hours per day. In the fall they met for a supervised practicum twice a month. During the summer workshop the teachers were taught three sets of basic skills: counseling, supervision, and individualizing instruction. In addition they were taught developmental theory from the perspectives of Erikson, Piaget, Kohlberg, and Hunt. Didactic and experiential modes of instruction were employed. The teachers were taught these skills for the ultimate objective of being able to teach them in turn to their students.

The fall practicum provided peer support for teachers' efforts to transfer the skills to practice in their own classrooms. It also provided a forum in which structured reflection on their classroom experiences could occur.

Data were collected in a pretest-posttest, nonequivalent-control-group design. The experimental group showed significant gains on the moral development measure, but not on the measure of ego development, nor conceptual systems. The control group showed no significant gains. Experimental student teachers also showed significant gains in communication skills as assessed by the Reflection of Feelings measure. The results were sufficiently encouraging to mount a second, more powerful intervention with larger samples.

Oja designed an intervention which explicitly required experimental teachers to design and implement action units in their own classes (Oja & Sprinthall, 1978). This involved use of the counseling, supervision, and individualizing instruction skills referred to above. In addition the teachers kept written journals of their classroom activities.

Pre- and postmeasures of conceptual development and moral development were taken. Experimental teachers showed significant gains on both. Measures of empathy and indirect teaching were also taken, revealing significant experimental gains in these skill areas as well.

Based on these studies, a more ambitious DPE intervention was undertaken as part of a two-year Teacher Corps project in a single junior high school (Oja, 1979). This intervention contained three interrelated components: 1) small support groups, 2) learning of complex teaching skills and developmental theory, 3) using the skills and theory in mini-units.

Pre- and posttests were administered to participating teachers using measures of conceptual, moral, and ego development. There was no control

group used in this analysis. The results are reminiscent of the original Bernier study; significant gains on the moral development measure (Rest, 1974) were found, but no significant gains were found on conceptual or ego development.

Summary of findings from the Deliberate Psychological Education studies. These studies were conducted in various settings, with students and teachers from several socioeconomic classes. Nonetheless, several commonalities emerged from these limited, but generally successful, efforts. It appears that theory and skills can be effectively linked in educational programs. Developmental theory guided the instructional design at each level of implementation. Guided reflection upon the experience of using the interpersonal and instructional skills clarified the developmental theory and contributed to further cognitive development.

Some type of peer support was another feature of these studies. According to both Kohlberg and Hunt, interpersonal context is a primary factor in development. Hunt has derived the optimum characteristics of interpersonal contexts for conceptual development from the conceptual levels model. Though its independent contribution was not investigated in these studies, there was ample theoretical and practice-based justification for including peer support as an essential component of a development program.

Role-taking, i.e., responsibly undertaking new meaningful roles with others, was another important component of these programs. Kohlberg and his associates have stressed the importance of role-taking for moral development. Acting out complex behaviors and taking on others' perspectives helps to lay the groundwork for disequilibration, providing, of course, that it occurs in a supportive interpersonal environment.

Finally, the clients were provided with on-going followup, usually in the form of seminars in which new learnings (experiential and didactic) could be reinforced and reflected upon. This, of course, comes from the recognition that qualitative psychological change does not occur overnight or, more to the point, as a result of a single workshop session. There certainly seems to be a minimum amount of time necessary for consolidation at a given level of development and transition to the next. Optimal conditions and interactions, then, need to be maintained over time.

Limitations of the findings from the DPE studies. Taken with the findings from previously cited cross-sectional studies and with what we know of development in other domains throughout childhood and adolescence, findings from these field-based DPE studies generally support the claim that adult cognitive development is possible. Furthermore, they indicate that certain kinds of interventions in certain contexts can be effective in stimulating development in several domains.

Unfortunately, the constraints of the field-based settings did not permit differential programs to be implemented for groups at different developmental levels. To some extent this is a moot point, given the apparent scarcity of individuals above Hunt's Level II, Piaget's Concrete operations, or Kohlberg's Stage 4.

In terms of the matching principle, then, the interventions were targeted more to the Level I clients in order to stimulate movement to Transition to Level II (Cl model) or from Kohlberg's Stage 3 to Stage 4. Most of the interventions were at least partially successful. To the extent that all of the individuals within the experimental groups were at CL I, then these interventions would be appropriate, but they would be less so for higher or lower CL clients. Some recent unpublished work by Sprinthall (Note 1)

confirms that clients at Sub I and at Transition to II and above show little or no gain compared to those at CL I with the above interventions. This condition simply militates against showing clear experimental gains, which might explain some of the equivocal findings. Longitudinal studies of clearly differentiated curricula, support networks, and counseling contexts are the obvious next steps to further validate the developmental claims and to refine stage-specific interventions.

A general limitation of the settings was mentioned by Oja (Note 2) in that the traditional self-contained classrooms may well have placed a ceiling on the amount of developmental change possible, presumably because that type of organization interferes with more collaborative teaching arrangements which would be important for movement to CL III. She suggests that "...in order for major change to occur [in teachers' developmental levels], significant change would be required in the entire educational environment including how the school system is organized" (Oja, Note 2, p. 13). Clearly the developmental paradigm implies profound reorganization of structures and institutions which have tended to block cognitive development. The mixed results of the junior high school Teacher Corps project underscore this point for future school or system-based interventions.

The DPE studies also left open the question of client "pull" (Hunt, 1976) on the facilitators of development. Though Hunt noted the apparent reciprocity of the matching principle, little has been done to investigate its reciprocal character nor to design developmental projects which take it into account. It is the reciprocal character of the CL matching principle which was investigated in the following study of cooperating teacher-student teacher pairs.

A Study of the Reciprocal Effects of Conceptual Level Matching on Cooperating Teacher-Student Teacher Pairs

Rationale

In the preceding review a strong argument was made for the importance of fostering cognitive development among both preservice and inservice teachers. It was shown that appropriate use of "effective" teaching skills was more likely among developmentally advanced teachers. It appears, in fact, that development is an essential precondition for teachers' higher-order behaviors. Clearly, cognitive development should be a primary goal of preservice and inservice teacher educators.

The Deliberate Psychological Education Studies showed that when student teachers interacted with environments which matched their developmental characteristics, they not only acquired content and skills, but they also showed positive developmental gain. Unfortunately, the student teachers' effect, or "pull," upon their cooperating teachers and vice versa was not examined. Yet, it stands to reason that the CL match of the student teacher and cooperating teacher within their clinical relationship could conceivably be a powerful component of both preservice and inservice developmental programs in and of itself. While not replacing other developmentally oriented preservice and inservice components, the clinical relationship between the student teacher and cooperating teacher, if based on a CL match, could certainly augment other developmental programs such as those explored in Sprinthall's Deliberate Psychological Education studies.

Except for Thies-Sprinthall's study (1980), the clinical relationship between the student teacher and cooperating teacher has not been examined from the standpoint of CL match/mismatch. Yet, the results of her study clearly indicate that not only is it an important factor, but that CL mismatch (low CL cooperating teacher, high CL student teacher) may lead to negative

consequences. Unfortunately, her study did not examine the possible reciprocal effects of CL match/mismatch on the cooperating teacher.

Given the extended, intensive interaction of the cooperating teacher with the student teacher, we must assume from the perspective of CL matching that both the cooperating teacher and the student teacher powerfully shape the other's interpersonal environment in the classrooms. (The pull of the students on both must be considered as well, but for purposes of this study it was assumed to be a randomized condition.) That is, the CL characteristics of each will necessarily constrain and structure the information and concepts that pass between them. To the extent that this structure is mutually compatible, we would expect to see CL gains over the course of the clinical relationship for both cooperating teacher and student teacher. If not, we would expect to see no gain.

Most of the matching model studies, though, have implied that, in the best of all possible worlds, high CL clinicians would work with lower CL clients and intentionally match the lower CL information processing requirements. This approach is flawed in at least four ways: 1) Possible reciprocal effects on the high CL clinician are not considered. 2) Practically, at present there are simply too few high CL clinicians to make much of an impact, and the cost of waiting until more develop is prohibitive. 3) This approach implies theoretically unsatisfactory infinite regress, i.e., individuals advance through conceptual levels by means of contact with more advanced individuals who, in turn, advanced by means of contact with more advanced individuals, ad infinitum. 4) It leads to disempowering, anti-democratic educational practice, reifying the rare high CL individual and the institutional arrangements that insure that rarity.

However, if we can assume reciprocal matching effects between client and clinician, then the practical possibilities abound for designing powerful, developmentally oriented preservice and inservice educational programs. Furthermore, the reciprocal effects feature of the matching principle, if shown to operate in the clinical relationship, would imply a rethinking and restructuring of many of the rigid, top-down, hierarchical features of present educational environments, at least those with a significant clinical component.

Assuming the reciprocal nature of the matching effects, then, the clinical relationship between student teacher and cooperating teacher would seem to be a particularly promising environment for fostering CL development, if they are initially matched on CL. Given this matching, the clinical relationship could augment other developmental components of preservice and inservice teacher education programs quite economically. In fact, it would require little in the way of intervention beyond initial assessment and matching.

Since the assumed reciprocal effects feature of CL matching has not been well studied, and because it is possibly of such crucial theoretical and practical importance, the study reported here was undertaken to begin its investigation.

Hypothesis

The following hypothesis was tested:

Student teachers and cooperating teachers who are initially matched on conceptual level, as measured by the Paragraph Completion Test (Hunt, et al., 1974), will show greater gains in CL development than mismatched pairs. Method

This study was part of a multi-site field investigation of the student teaching experience (Griffin, Barnes, Hughes, O'Neal, Defino, Edwards, &

Hukill, Note 3). The investigation covered a four-month semester of student teaching from September to December. Qualitative and quantitative data were gathered on the participants throughout the semester, including background data interviews, observations, measures of cognitive, personality, and professional characteristics (CL among them), and measures of outcomes. Because it was conceived of as a broad, comprehensive look at the student teaching experience from several perspectives (one of the first of its kind), its emphasis was descriptive rather than interventionist. There were no developmental programs like those in the Deliberate Psychological Education series in place at the individual school or university settings where the internships took place.

Participants. Ninety-three student teachers who were just entering the clinical component of their training and 88 cooperating teachers began the study. Sixty-seven of the student teacher-cooperating teacher pairs completed this study. Thirty-nine of the student teachers were from a large, private university and their placements were with cooperating teachers in a metropolitan school district. Twenty-eight student teachers were from a large, public university and their placements were with cooperating teachers in a medium-sized urban school district.

Procedure. All participants responded to the Paragraph Completion Test (Hunt, Greenwood, Noy, & Watson, Note 4) at the beginning and end of the semester. The PCT is a semi-projective measure which is designed to tap the level of complexity and organization of interpersonal concepts. It is scored on a continuous scale from 0 (Sub I) to 7 (Level IV). The tests were scored blindly by an expert whose intra-rater reliability coefficients ranged above .90.

All student teachers were routinely assigned to their cooperating teachers according to the established procedures of their respective university programs. For purposes of this study they were assumed to be randomly assigned. Once paired, participating student teachers and their cooperating teachers were pretested within the first two weeks of the internship and were post-tested at its conclusion four months later.

Pretest scores were examined to determine the degree of match between the student teachers and their cooperating teachers. Participants whose pretest scores differed by more than .20 were considered Mismatched (n=78). The remaining participants were considered Matched (n=66). Residual gain scores were computed as a measure of each participant's conceptual level development over the course of the internship.

Results

The residual gain scores were analyzed by means of a nested analysis of variance design with student teacher--cooperating teacher roles nested by pair within the matching conditions which were crossed. Results are presented in Table 1. The matching effect was significant at $p = .06$.

Table 1. Source Table for Nested-Factorial ANOVA of Conceptual Level Scores.

Source	SS	df	MS	F	p
Matching	.352	1	.352	3.608	$p = .06$
Pair within	6.334	65	.097	.978	$p = .54$

Discussion

An examination of the pretest and posttest means for the matched and mismatched pairs (Figure 3) show the trend for matched pairs to be in the predicted direction. A surprising finding was that the scores for the mismatched pairs actually seemed to drop over time. This underscores the possible negative consequences of CL mismatch which was hinted at in the previous Thies-Sprinthall study (1980).

Although the matching effect appears rather weak by some standards, the exigencies of the field-based approach tended to militate against its expression. That it appeared at all under highly variable field conditions shows promise.

An important constraint of the field setting was the short (developmentally speaking) duration of the internship period studied. Since no other explicitly developmental components were systematically in place as here part of the internship, as in the DPE studies, a longer period of interaction would probably be required for stronger matching effects to manifest.

Another possible constraint was mentioned before by Oja (Note 2). It may have been that the student teachers' conceptual level development was essentially capped by their institutional contexts which generally speaking do not seem to permit broad-based conceptual development. Other developmentally hostile factors may have operated as well, such as economic stress, social pressure, conflicting allegiances, political impotence. Since these were not specifically sought out and controlled for in this study, their possible influence must remain speculative for now.

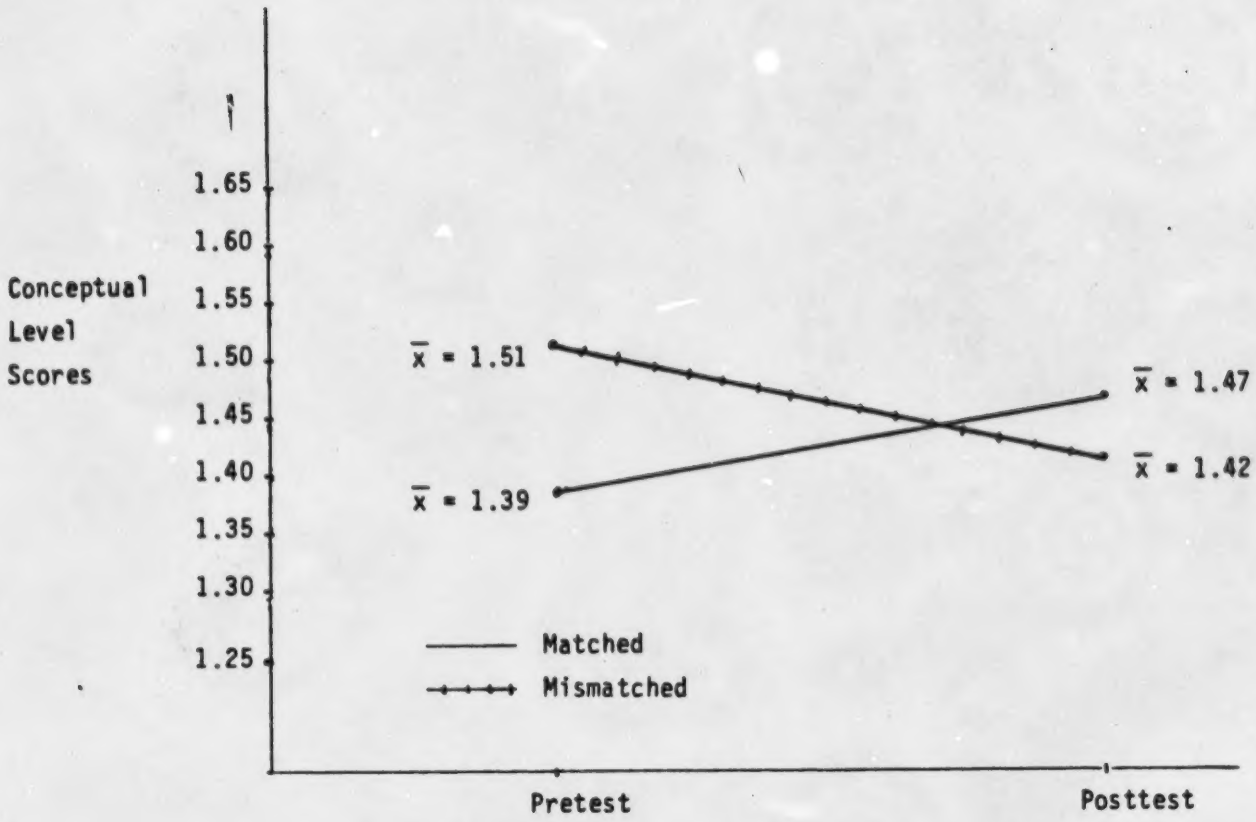


Figure 3. Pretest and posttest means of matched and mismatched pairs.

However, in spite of the constraints mentioned above, this initial study has shown that the apparent reciprocal character of the matching effect should be investigated more intensively and more rigorously. Matching conditions of longer duration should be studied. Nine month internships, for example, should be studied rather than the four month period studied here. In student teaching programs explicitly committed to cognitive development, the matching condition should be systematically varied in order to explicate its relationship to other components of the programs. Finally, matching should be studied in other types of clinical contexts such as peer supervision.

In conclusion, this study offers tentative support for the reciprocal character of Hunt's matching principle. Though in most contexts it will probably not solely induce long-term development, the reciprocity of the matching effect probably can be a very cost-effective means to complement and augment other developmental components of preservice and inservice programs.

Furthermore, though this study was concerned with the matching effect on pairs of interacting adults, these findings suggest that matched groups may also be developmentally efficacious. The successful peer group strategies of staff development pioneered by Bentzen (1974), Tikunoff, Ward, and Griffin (1981), and others may well be further improved by the use of the reciprocal matching principle as a guide for the structurings of peer groups. Certainly this approach bears further investigation.

Though necessarily tentative and suggestive, the findings reported here promise a fruitful refinement of Hunt's CL model. Currently, studies are underway which are more closely examining the clinical supervisory relationship. Other studies are being piloted to study possible matching effects among intact groups in a variety of contexts. In this instance at

least, the tired old injunction that more research is needed seems refreshingly apt.

Because of its genesis in secondary and post-secondary educational contexts, rather than in child psychology it was argued that the implications of Hunt's CL model were directly applicable to the design of developmentally sound adult educational environments. Of particular interest was the matching principle which states that in general, low CL individuals require high-structure environments and vice versa. Evidence for the CL model and for its matching premise was presented, particularly focusing on teacher education contexts.

Studies of successful programs designed to foster cognitive development among student teachers were presented. Features common to these programs and their limitations were discussed and suggestions for future study were made. One particular suggestion stressed the need to study the possible reciprocal character of the matching principle. It was argued that if it could be shown to operate reciprocally between client and clinician, then the Hunt model could be refined such that theoretically unsatisfactory infinite regress is avoided and that more empowering, democratic, and effective educational practice could result.

Results of an exploratory, field-based study of the possible reciprocal character of the matching principle were presented. The findings were sufficiently promising to justify larger, more powerful studies of the possible reciprocal character of the matching principle. Directions for future research and implementation were discussed.

In conclusion, though at times equivocal in their findings and problematic in their application, the studies conducted over the last two decades on adult cognitive development have shown that developmental goals

should be basic to adult educational programs, particularly those in preservice and inservice clinical teaching contexts. The developmental paradigm can clearly assist educators make sense of and make decisions about the exceedingly complex world of education. From the developmental standpoint, we are led not only to critique many institutional arrangements that seem to be developmentally hostile, but to offer powerful, practical, cost-effective alternatives to them. At this juncture, then, we might say that developmentally sound adult education has weathered its identity crisis.

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